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ECONOMICS OF COW-CALF PRODUCTION ONTARIO, 1987

by
Jim Fisher

Economics and Policy Coordination Branch
Ontario Ministry of Agriculture and Food
Legislative Buildings, Queen's Park
Toronto, Ontario
M7A 1B6
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ECONOMICS OF COW-CALF PRODUCTION

INTRODUCTION

Cost of production studies were initiated in 1987 in the cow-calf, beef feedlot and sheep enterprises. The studies were designed to determine revenue and cost relationships for an enterprise, as well as physical and resource information about the enterprise. This study was limited to the cow-calf portion of the total farm business. Thus only costs and revenues directly associated with the cow-calf enterprise were included.

Any harvested crop production, even if it was consumed completely by the cow-calf herd, was considered as a separate enterprise. Any home grown feed consumed by the cow-calf enterprise was considered a cost to it and was accounted for at fair market value.

Land, machinery, overhead or other production costs due to feed crops were accounted for in the price of the feed. Any profit due to crop production was not included in the cow-calf budget. Pasture was considered part of the cow-calf enterprise.

The data for this report was collected by visiting twenty-seven cow-calf producers around the Province. Detailed information about each farm was processed for the year 1987. The survey included 2,964 head for an average herd size of 110 bred cows. Although the average herd size in Ontario was less than twenty cows, larger herds were used to obtain farm records specific to beef cows. For the purpose of reporting budgets for different areas of Ontario, the Province was split into two areas: (1) Southern & Western Ontario, and (2) Eastern, Central & Northern Ontario.

METHODS AND PROCEDURES

Farm cooperators, from all five regions of Ontario were visited to collect the data. An enterprise balance sheet was extracted from the farm balance sheet. Cow-calf revenues, prices, costs, and input/output quantities were extracted from the farmer's record book. A cow-calf computer model was used to input the operator's data, and to prepare an enterprise analysis. The computer model was designed particularly for this purpose. Cooperators were provided with a printed copy of the analysis of their farm during the farm visit and adjustments were made following a discussion. Each cooperator's data were confidential and are only presented in an aggregate form.

When the survey was completed, all enterprise records were combined to give a weighted average revenue/cost per bred cow, as well as weighted input/output information. Budgets were prepared for the two areas of Ontario and for Ontario as a whole. The budgets were completed on an accrued basis with the size of the breeding herd held constant.

REVENUES

All the calves produced by the cow-calf herd are assumed to be sold as weaned calves except for the heifers needed to replenish the cow herd due to normal culling and death losses. The heifers kept for breeding are shown as a revenue at the value of a bred heifer entering the herd. Cull cow sales are not shown. The culling of cattle is represented by a cost based on the loss in value that occurs when a cull cow is replaced by a bred heifer entering the herd. The other revenues included were those generated by tax rebates, both fuel and property tax, and by tripartite stabilization pay-outs. The budgets generated assume that all cows are enroled in tripartite stabilization.

FEED COSTS

All feed was budgeted at fair market value, based on local feed prices given by the cooperators surveyed. A large portion of the feed consumed on cow-calf operations was home grown.

The type of feed, its value and the quantities fed were attained from the cooperator. Actual quantities of feed fed was seldom recorded by the cooperators. The computer model calculated the feed requirements based on the feeds used by the farmer and the National Research Council's Nutrient Requirement tables. These requirements were used to confirm the amount of feed needed in the winter feeding period and were helpful to the cooperators in allocating their feed between enterprises.

Feed costs include all home grown and purchased feeds, supplements, salt/minerals/ vitamins, pasture rentals and bedding. The costs associated with owned pasture are buried in several cost categories due to the difficulty in separating them. For the purpose of this study, pasture was considered part of the cow-calf enterprise.

INTEREST ON OPERATING CAPITAL

The average outstanding operating capital was calculated and interest was charged on both the debt and equity portion. The market value balance sheet generated determined the percent equity. The debt portion of operating capital was charged at 11.2 percent and the equity portion at 5.1 percent. Based on an 80 percent equity level, the average rate of interest on operating capital was 6.32 percent.

OTHER CASH EXPENSES

Hired labour was charged at the actual cost for labour hired to work with the cattle.

Machinery costs, including fuel, repairs, and interest on investment included only that proportion directly involved in the cow-calf operation. Machinery use included feeding, manure clean out, pasture maintenance and truck use. The cost of spreading manure was not included as it was assumed that the value of the manure to the crop enterprise equalled the cost of spreading. The cost of machinery due to cropping was included in the price of the feed since feed was priced at fair market value. Equipment rental and custom work

consisted of truck or tractor rental. The cost of trucking cattle to market was included here.

Breeding costs consisted of artificial insemination and bull depreciation. Bulls were depreciated over 3.7 years of use. The bred cow to bull ratio was 36:1.

Marketing charges include yardage, commission, insurance and the Ontario Cattleman's Association checkoff. The costs included were the actual charges recorded and reflect the fact that not all calves are sold as calves and that not all calves sold were sold through a stock yard or auction barn.

TERM INTEREST

An interest rate of 11.2 percent was charged on 20 percent of the value of the breeding livestock, machinery, buildings and land allocated to the cow-calf enterprise. This represents the portion of the operation financed by debt. The opportunity cost for interest on investment for the equity portion was included at the end of the budget and was calculated at 5.1 percent. This rate was used to represent the real or after inflation rate.

DEPRECIATION

Depreciation on buildings was calculated using the straight-line method and a rate of 5 percent. Both the market value and a salvage value was obtained from the cooperator.

Machinery compliments used in the cow-calf enterprise were assumed to be five years old. If machines were used for other farming operations, costs were adjusted for the proportion of time spent on the cow-calf enterprise. The declining balance method of depreciation was used, and a 15 percent rate to powered and a 10 percent rate to non-powered machines was applied.

GROSS MARGIN

The gross margin is the revenue (less the property tax rebate) minus the variable costs. This is the amount that the enterprise can contribute to the fixed costs.

NET ENTERPRISE INCOME

The revenue minus the total enterprise costs is the net enterprise income. This is the return to owner's equity, operator's labour, management and risk.

BALANCE SHEET

The enterprise balance sheet only includes assets that are directly associated with the cow-calf enterprise. All assets are valued at market value. Current liabilities were those directly associated with the cow-calf enterprise. Term debt was allocated to the enterprise on a proportioned basis.

Figure 1. Balance Sheet per Bred Cow, Ontario, 1987

	$		$
CURRENT ASSETS	139	CURRENT LIABILITIES . . .	56
Machinery	140		
Cows	745		
Heifers	148		
Bulls	43		
INTERMEDIATE	1,076	TERM LIABILITIES	368
Buildings	371	TOTAL LIABILITIES	424
Land (2.06 acres)	535		
LONG-TERM ASSETS . .	906	EQUITY	1,697
TOTAL ASSETS	2,121	TOTAL EQUITY & DEBT . .	2,121

Figure 2. Balance Sheet per Bred Cow, Area 1, 1987

	$		$
CURRENT ASSETS	115	CURRENT LIABILITIES . . .	72
Machinery	148		
Cows	778		
Heifers	137		
Bulls	46		
INTERMEDIATE	1,109	TERM LIABILITIES	503
Buildings	353	TOTAL LIABILITIES	575
Land (1.85 acres)	721		
LONG-TERM ASSETS . .	1,074	EQUITY	1,723
TOTAL ASSETS	2,298	TOTAL EQUITY & DEBT . .	2,298

Figure 3. Balance Sheet per Bred Cow, Area 2, 1987

	$		$
CURRENT ASSETS	184	CURRENT LIABILITIES . . .	26
Machinery	126		
Cows	701		
Heifers	112		
Bulls	41		
INTERMEDIATE	980	TERM LIABILITIES	171
Buildings	405	TOTAL LIABILITIES	197
Land (2.45 acres)	220		
LONG-TERM ASSETS . .	625	EQUITY	1,592
TOTAL ASSETS	1,789	TOTAL EQUITY & DEBT . .	1,789

Table 1. Annual Cow-Calf Budget per Bred Cow, Ontario, 1987

REVENUES	- $ per bred cow[1] -
Steers	280.71
Heifers	293.17
Fuel Tax Rebate	2.16
Property Tax Rebate	11.89
Tripartite Deficiency Payment	0.00
Total	587.93
Variable Expenses	
Feeds: - Homegrown Feeds at F.M.V.[2]	144.65
- Purchased Supplement	2.79
- Salt, Mineral, Vitamin	1.96
- Pasture Rental	12.33
- Bedding	11.99
Hired Labour	26.89
Fuel, Oil, and Grease	14.05
Equipment Repair and Maintenance	19.98
Equipment Rental and Custom Work	5.89
Livestock Supplies	12.69
Breeding Costs	5.12
Veterinary and Medicine	20.22
Tripartite Premiums	7.70
Marketing Charges	4.02
Miscellaneous	3.41
Interest on Operating Capital	10.26
Replacement of Cows (including death loss)	49.65
Total Variable Expenses	353.60
Fixed Expenses	
Electricity	4.62
Telephone	1.16
Property Taxes	11.89
Building and Fence Repair	12.40
Property Insurance	6.84
Vehicle Registration and Insurance	1.63
Term Debt Interest (cows, machinery buildings, land)	42.76
Non-Cash Expenses	
Depreciation on:	
- Machinery and Equipment	10.44
- Buildings	12.85
TOTAL ENTERPRISE COSTS	458.19
GROSS MARGIN	222.44
NET ENTERPRISE INCOME	129.74
Interest on Investment in: (equity portion)	
- Cows, Heifers and Bulls	37.54
- Machinery and Equipment	5.75
- Land and Buildings	36.15

Note: 1. This budget is based on an average herd size of 110 bred cows.
2. F.M.V. - Fair Market Value.

Table 2. Annual Cow-Calf Budget per Bred Cow, 1987, Area 1 and Area 2

	Area 1[1]	Area 2[2]
REVENUES	- $ per bred cow -	
Steers	280.35	281.36
Heifers	303.56	273.73
Fuel Tax Rebate	2.36	1.80
Property Tax Rebate	14.31	7.35
Tripartite Deficiency Payment	0.00	0.00
Total	600.58	564.24
Variable Expenses		
Feed: - Homegrown Feed at F.M.V.	124.31	182.74
- Purchased Supplement	3.34	1.78
- Salt, Mineral, Vitamin	1.62	2.62
- Pasture Rental	10.31	16.10
- Bedding	12.12	11.75
Hired Labour	31.14	18.94
Fuel, Oil, and Grease	15.69	10.98
Equipment Repair and Maintenance	21.96	16.28
Equipment Rental and Custom Work	2.57	12.11
Livestock Supplies	15.33	7.76
Breeding Costs	5.90	3.66
Veterinary and Medicine	22.53	15.89
Tripartite Premiums	7.70	7.70
Marketing Charges	0.91	9.85
Miscellaneous	2.18	5.72
Interest on Operating Capital	10.19	10.40
Replacement of Cows (including death loss)	57.72	34.53
Total Variable Expenses	345.52	368.81
Fixed Expenses		
Electricity	4.61	4.63
Telephone	1.26	0.97
Property Taxes	14.31	7.35
Building and Fence Repair	11.28	14.51
Property Insurance	7.48	5.63
Vehicle Registration and Insurance	1.80	1.32
Term Interest {cows, machinery buildings, land}	58.61	19.50
Non-Cash Expenses		
Depreciation on:		
- Machinery and Equipment	11.12	9.18
- Buildings	12.05	14.34
TOTAL ENTERPRISE COSTS	468.04	446.24
GROSS MARGIN	240.75	188.08
NET ENTERPRISE INCOME	132.54	118.00
Interest on Investment in: (equity portion)		
- Cows, Heifers and Bulls	36.14	39.19
- Machinery and Equipment	5.66	5.72
- Land and Buildings	38.27	26.95

Note: 1. The Area 1 budget is based on an average herd size of 129 bred cows.
2. The Area 2 budget is based on an average herd size of 86 bred cows.

Table 3. Cow-Calf Industry Performance Indicators, Ontario, 1987

	Units	Ontario	Area #1	Area #2
RESOURCE PERFORMANCE				
Tillable Crop Land per Bred Cow	acres	0.94	0.72	1.26
Pasture Land per Bred Cow	acres	2.06	1.85	2.45
Winter Feeding Period	days	204	196	225
Calf Crop	percent	87	87	87
Calf Produced per Bred Cow	pounds	455	449	468
Weaning Weight - Steer (shrunk)	pounds	543	538	560
- Heifer (shrunk)	pounds	503	496	513
Sale Value - Steers	$/head	639	646	633
- Heifers	$/head	564	575	539
Feed Cost per cwt. Calf Weaned	$	38	34	46
Annual Culling Rate	percent	12.5	12.0	14.0
Death Rate to Cows & Heifers	percent	1.5	1.8	1.0
Breeding Cows to Bull Ratio		36:1	35:1	40:1
Number of Farms Surveyed	#	27	15	12
Average Number of Bred Cows	#	110	129	86
VALUE OF ENTERPRISE PRODUCTION per Bred Cow	$	574	584	555
TOTAL COSTS per Bred Cow	$	444	453	437
Share of Total Costs				
Feed	percent	39.1	33.6	49.2
Other Variable Costs	percent	40.1	42.4	34.8
Term Interest	percent	9.6	13.0	4.4
Depreciation	percent	5.2	5.1	5.4
Other Fixed Costs	percent	6.0	5.9	6.2
Total	percent	100.0	100.0	100.0
PROFITABILITY				
Net Enterprise Income per Bred Cow	$	129.74	132.54	118.00
Gross Margin per Bred Cow	$	222.44	240.75	188.08
Break Even Revenue per cwt. of Calf				
- Gross Margin	$	77.24	76.43	78.42
- Total Enterprise Costs	$	97.61	100.53	93.40
PERFORMANCE EFFICIENCY				
Capital Turnover Ratio	years	3.70	3.94	3.22
Cost Control Index	percent	22.60	22.70	21.26
LIQUIDITY & SOLVENCY				
Equity	percent	80.0	75.0	89.0
Debt Structure	percent	13.2	12.5	13.4
Current Ratio		2.5:1	1.6:1	7.0:1
Equity per Bred Cow	$	1,697	1,723	1,592
Working Capital per Bred Cow	$	83	43	158

APPENDIX I

FORMULAS

1) VALUE OF ENTERPRISE PRODUCTION
= Steer and Heifer Sales + Tripartite Deficiency Payments

2) TOTAL COSTS
= Total Enterprise Costs - Tax Rebate - Fuel Rebate

3) BREAK EVEN REVENUE (GROSS MARGIN)
= (Variable Expenses - Fuel Tax Rebate) / Total cwts of Weaned Calf

4) BREAK EVEN REVENUE PER CWT OF CALF WEANED
= (Total Enterprise Costs - Fuel Tax Rebate - Property Tax Rebate) / Total cwts of Weaned Calf

5) CAPITAL TURNOVER RATIO = $\frac{\text{Total Enterprise Assets}}{\text{Value Enterprise Production}}$ = Years

6) COST CONTROL INDEX = $\frac{\text{Net Enterprise Income}}{\text{Value of Enterprise Production}} \times 100$

7) PERCENT EQUITY = $\frac{\text{Equity}}{\text{Total Enterprise Assets}} \times 100$

8) WORKING CAPITAL = Current Assets - Current Liabilities

9) CURRENT RATIO = $\frac{\text{Current Assets}}{\text{Current Liabilities}}$

10) DEBT STRUCTURE = $\frac{\text{Current Liabilities}}{\text{Total Liabilities}} \times 100$

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